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ALCES VOL. 31 (1995) pp.111-124

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VOLUME 31, 1995



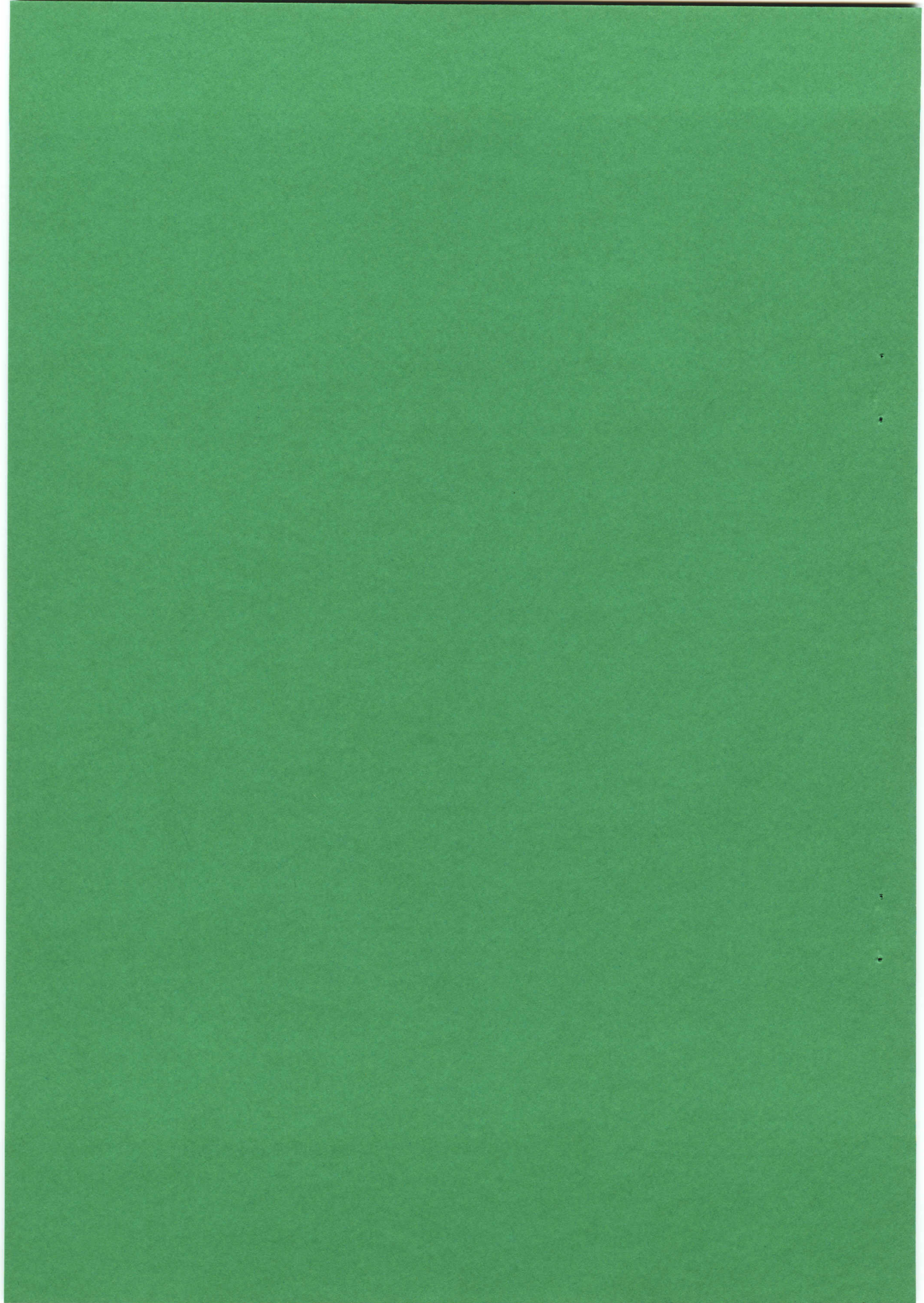
Co-editors:

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ISSN 0835-5851

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## POTENTIAL MISUSE OF BLACK BEAR LICENCES TO HARVEST MOOSE IN NEWFOUNDLAND: A REVIEW

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**ABSTRACT:** Wildlife management policy is often strongly influenced by public perception. In Newfoundland, the inappropriate use of the black bear licence to harvest moose has been rumoured since the introduction of the current management systems for both species in 1973, pressuring managers to alter harvest programs. The opportunity for misuse potentially exists for 4 groups of moose hunters: those successful in procuring both a moose licence and a bear licence for different management units (MU's), enabling hunters to harvest moose in a more preferred area than that for which they are licenced; those unsuccessful in procuring a moose licence who purchase a bear licence to hunt moose anyway; those with a bear licence but no connection to the moose/caribou licencing system; and those convicted of big game hunting violations who purchase a bear licence to hunt moose illegally. This paper attempts to assess objectively the amount of abuse that could be occurring and evaluates reasonable management responses to these problems.

A dramatic increase in bear licence sales following the introduction of a more restrictive moose management system in 1973, as well as a drop in bear licence sales after the establishment of non-overlapping moose and bear hunting seasons in 3 MU's implied misuse. From 1989 to 1994, 223,705 moose hunters were allotted licences, 5,918 (2.6%) purchased a black bear licence and 3,517 (1.6%) selected for a bear MU different than their moose MU. Similarly, of the 141,934 hunters who applied but did not receive a moose licence, 7,280 (5.1%) purchased a black bear licence. These licence sales do however mean that most bear licence holders were associated with the moose hunt application process; of 18,348 black bear hunters, 32.3% (5,918) also held a moose licence, and 39.7% (7,280) were unsuccessful in procuring a moose licence. Eighteen percent of bear hunters did not participate in the moose hunt process at all. Individuals convicted of big game offenses were permitted to purchase bear licences, and while they were considered at high risk for further illegal activity only 5.2% (25/482) purchased a bear licence.

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Wildlife management is, when at its best, both an art and a science. Ideally, those who practice it ought to be enviably capable of deciphering the nuances of public perception, the attendant political vagaries, and the details of rigorous science. Little wonder then that the perfect balance is only fleetingly glimpsed and seldom captured, at least not at the first attempt. It remains imperative to the successful conservation of wildlife however, that we neither stray too far into the nether world of rumour nor into the often sterile pantheon of science. It must be borne in mind as well that wildlife management is

as much a manipulation of the human animal as it is of specific wildlife populations and their habitats.

In Newfoundland, there has emerged over the last 20 years a conviction on the part of many hunters, and some politicians and conservation professionals, that the black bear licence is a virtual ticket to the illegal killing of other big game species, especially moose. This conclusion has enjoyed wide dissemination, bolstered by frequent anecdotal references but limited direct evidence. It has nevertheless infiltrated many discussions and influenced the attitude of many individuals

respecting the legitimacy of black bear hunting in Newfoundland. It has also frequently emerged in public meetings and was often the subject of correspondence to political offices and to the Newfoundland and Labrador Wildlife Division. Even amongst wildlife enforcement officers these charges were often rendered with conviction, emphasising that such abuse was widespread and having significant detrimental effect on both enforcement programs and on moose numbers. But how justified are these concerns and what evidence is there to support them?

Black bears were first listed as a game

species in Newfoundland in 1962. Since that time their management has been based on a zone system originally instituted for moose. Currently bear hunting is permitted in 33 of 46 Management Units (MU's), and is prohibited in areas where black bears are absent or scarce (Fig. 1); and generally moose and bear hunting seasons coincide or overlap considerably. Since 1981 the Newfoundland and Labrador Wildlife Division (NLWD) has strived, with some success, to increase interest in bears generally and in black bear hunting specifically through a variety of measures including public presentations, media

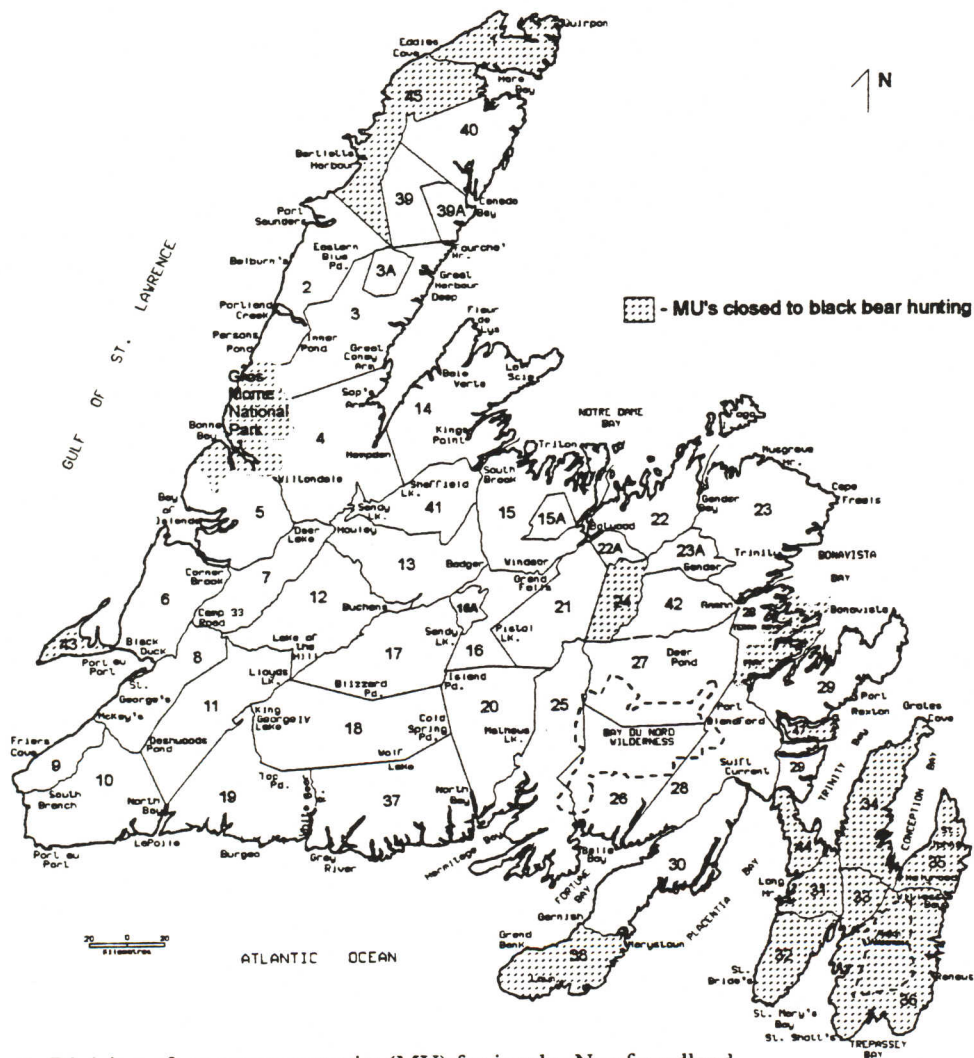


Fig. 1. Division of management units (MU) for insular Newfoundland.

interviews and the establishment of a spring hunt (MacCharles and Mahoney 1994). Partly as a consequence, black bear harvests have increased (Fig. 2) and the species is now important to a growing number of resident hunters as well as to the expanding Outfitting and Tourism industries.

Black bear harvests remain low however, and consequently fewer restrictions have been placed on the allocation of bear licences compared to those for moose and caribou, the province's other big game species. For example, there is no quota on black bear licences, so it is possible to purchase a bear licence in addition to a moose or caribou licence. As well, more than one bear licence can be purchased within the same season, and these can be for different MU's. In contrast, moose and caribou licences are exclusive of one another, are allocated on a strict MU quota system, and only one licence can be held in any one year. Because it is illegal in Newfoundland to carry a firearm without a valid hunting permit, the more easily obtained black bear licence can provide hunters with the opportunity to harvest moose or caribou illegally in their MU of choice while at the same time constraining the efficacy of

wildlife enforcement operations. This problem is considered much more serious in the case of moose because 22,000 more moose than caribou licences are sold annually.

There are 4 groups of hunters rumoured to use the black bear licence inappropriately (Table 1). The first are hunters who receive a moose licence, but not for the MU of their choice, and who then buy a bear licence for a preferred MU and hunt moose illegally there. A preferred MU may be the one in which they live, allowing them to hunt close to home, or one adjacent to their moose licence MU, enabling them to (illegally) expand their moose hunting area. Sometimes however this MU may be distant from either location but simply provide better moose hunting opportunities through higher moose densities and/or increased accessibility. Many hunters in these situations subsequently report killing a moose in the MU named on their moose licence while actually having taken it from another, ie. that in which they were licenced to hunt black bear.

The other three groups are comprised of bear licence holders without a moose licence. First are hunters who applied but were unsuccessful in obtaining a moose licence and who

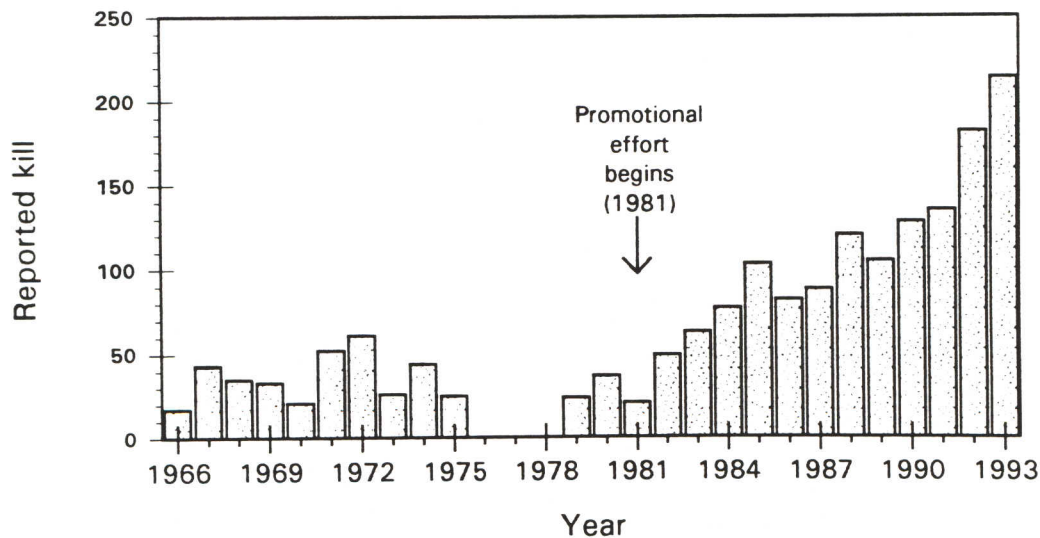


Fig. 2. Hunter reported kill of black bears in insular Newfoundland, 1966-1993.

Table 1. Ways in which black bear licences may be inappropriately used to hunt moose in Newfoundland.

Hunter category	Potential Problem
Hunters with black bear and moose licences for the <b>same</b> MU.	None.
Hunters with black bear and moose licences for <b>different</b> MU's.	Licence for moose may not be in the MU of choice; hunters purchase bear licences to hunt moose in the preferred MU.
Hunters unsuccessful in procuring a moose licence but who purchase a bear licence.	Hunters do not have a moose licence but they purchase bear licences to hunt moose anyway, either for themselves or for licenced moose hunter.
Hunters with black bear licences only, but who did not apply for a moose licence.	Hunters purchase bear licences to hunt moose, either for themselves or for a licenced moose hunter.
Hunters convicted of big game violations and purchase a bear licence.	Hunters prohibited from obtaining moose licences but they purchase bear licences to hunt moose.

then buy a black bear licence to hunt moose either for themselves or to assist a friend who possesses a moose licence. Second are hunters who did not apply for a moose licence but purchase a bear licence to use in a similar manner to the first group. Finally, there are hunters convicted of big game hunting violations who are prohibited from applying for a moose licence for 5 years, but who may purchase a bear licence during this period of sentence. These individuals are considered likely to engage in future illegal hunting activity, including the killing of moose.

It is impossible to determine the actual extent of these licence infractions. Our objective here is to quantify the potential scope of such activity relative to the illegal harvest of moose, to juxtapose the available evidence with the perceptions and opinions that have been expressed, and to review appropriate management responses. This evaluation is important for the management of moose as well as black bear, and in the broader sense

permits an evaluation of the distance that may sometimes separate myth from reality within the context of wildlife management. It further offers a rare chance to quantify possible illegal hunting activity, reliable statistics for which are notoriously difficult to acquire.

## METHODS

In 1989, the NLWD implemented a computerized system for issuing black bear licences, similar to that already in place for moose. Prior to this, black bear licences were sold through vendors, and were unavailable for this analysis. We cross-referenced black bear and moose licences for individuals holding both licences and compared their choices of bear and moose MU's to determine if they were the same, had shared boundaries, or were distant from one another. Black bear licence MU's were also assessed relative to the MU of the hunter's residency to identify possible advantages regarding illegal har-

vesting of moose. Our evaluation focused on the fall hunting season and did not include individuals participating in the spring bear hunt because moose hunting does not occur at that time of year. In addition, only licences sold to resident hunters were evaluated, since non-resident hunters can hunt only under the guidance of an outfitter and were considered constrained in their abilities to participate in this illegal activity.

### **The Potential For Abuse**

To evaluate this aspect we defined 4 categories of bear licence holders: **1.** those bear hunters who were successful moose licence applicants (here called combination hunters); **2.** bear hunters who were unsuccessful in their application for a moose licence; **3.** bear hunters with no connection to the moose hunt or application process; and **4.** those individuals convicted of big game violations who nevertheless purchased a bear licence during their sentence. It was assumed in our analysis that only combination hunters with both licences in the same MU were legitimate, and that all other persons holding bear licences could misuse them in one way or another. While it is acknowledged that many bear hunters are genuine and do not poach moose on their bear licence, by taking this approach the maximum potential abuse could be determined. We further considered those who held moose and bear licences for different MU's the most likely to illegally harvest moose. The black bear applicant database was also compared with the list of individuals convicted of big game violations to determine how many of these individuals purchased at least 1 black bear licence during their 5-year conviction period. Only the 1993 conviction listing was available for this analysis.

During the 6 years examined, moose harvest quotas changed within each MU making it necessary to convert the data into percentages to make comparisons across MU's

and across years. Thus combination hunters were described as proportions of total moose and total bear hunters; and unsuccessful moose applicants with bear licences, as proportions of both all unsuccessful moose applicants and total black bear hunters.

### **Evidence of Abuse**

We searched NLWD records of black bear and moose licence sales from 1966 onwards for patterns that would suggest associations between them, and which might indicate if, and where and when, abuse of the black bear licence had occurred. In particular, we were looking for sharp increases in black bear licence sales that were not accompanied by an increase in black bear harvests especially where such events followed a decrease in moose quotas. In addition, black bear and moose licence sales, and moose hunter success rates were examined for 3 MU's where non-overlapping bear and moose hunting seasons had been introduced by NLWD in 1986 and 1988 in an attempt to quantify perceived abuse. Finally, we conducted a detailed examination of 1989-1994 data to determine what influence an individual's success in acquiring a moose licence had on their subsequent purchase of a black bear licence and whether their area of residence and/or their moose MU influenced their choice of black bear MU. Chi-square goodness-of-fit (2x2 table) analyses tested for each year the null hypothesis that success in obtaining a moose licence was independent of the tendency to purchase a bear licence (Zar 1984).

## **RESULTS**

### **The Potential For Abuse**

Between 1989 and 1994, 2.6% (5,918 of 223,687) of Newfoundland moose hunters also purchased a black bear licence (Table 2). Approximately 60% (3,517) of these combination hunters, or 1.6% of all resident moose hunters, purchased bear licences for areas

Table 2. Trends for resident moose and black bear hunters expressed as a proportion of successful moose licence applicants in Newfoundland, 1989-1994.

Year	Total moose hunters	Moose hunters with a bear licence						Combination hunters with both licences for different MU's
		Total n	%	Different MU n	%	Same MU n	%	
1989	30,506	530	1.7	431	1.4	99	0.3	81.3 %
1990	39,179	756	1.9	573	1.5	183	0.5	75.8
1991	42,790	1143	2.7	643	1.5	500	1.2	56.3
1992	40,019	1412	3.5	867	2.2	545	1.4	61.4
1993	36,870	1101	3.0	455	1.2	646	1.8	41.3
1994	34,323	976	2.8	548	1.6	428	1.2	56.1
Total	223,687	5,918	2.6	3,517	1.6	2,401	1.1	59.4

different from their moose licence MU. Combination hunters accounted for approximately 32.3% of all bear licences sold during this period (Table 3). Of combination hunters, the proportion with bear and moose licences for different MU's declined substantially during the 6 years studied, from 81.3% in 1989 to 41.3% in 1993; in other words hunters with both licences for the same MU increased from 18.7% to 58.7% (Table 2).

During the same period, 5.1% (7,280 of 141,934) of hunters unsuccessful in procuring a moose licence purchased a black bear licence, with average numbers in the last 3

years (6.5%) twice those of the first 3 years (3.2%) examined (Table 4) and while black bear licence sales increased by 64% over this period, the percentage of these licences sold to unsuccessful moose licence applicants increased disproportionately from 16.5% in 1990 to 55.3% in 1994 ( $\chi=39.7\%$ ; Table 3). Overall an average of 72.0% of black bear hunters were also moose licence applicants. While only 5.1% of unsuccessful moose licence applicants purchased a black bear licence, in 5 of 6 years examined unsuccessful moose licence applicants were more likely to purchase a bear licence than successful moose

Table 3. Trends for resident moose and black bear hunters expressed as a proportion of bear hunters in Newfoundland, 1989-1994.

Year	Total number of black bear licence holders	Number (%) of bear hunters with just a bear licence	Number (%) of bear hunters with a moose licence			Number (%) of bear hunters unsuccessful in obtaining a moose licence
			Total	Different MU	Same MU	
1989	2,204	600 (27.2)	530 (24.0)	431 (19.6)	99 (4.5)	714 (32.4)
1990	2,668	1,010 (37.9)	756 (28.3)	573 (21.5)	183 (6.9)	439 (16.5)
1991	2,895	654 (22.6)	1,143 (39.5)	643 (22.2)	500 (17.3)	713 (24.6)
1992	3,650	376 (10.3)	1,412 (38.7)	867 (23.8)	545 (14.9)	1,654 (45.3)
1993	3,326	218 (6.6)	1,101 (33.1)	455 (13.7)	646 (19.4)	1,765 (53.1)
1994	3,605	466 (12.9)	976 (27.1)	548 (15.2)	428 (11.9)	1,995 (55.3)
Total	18,348	3,324 (18.1)	5,918 (32.3)	3,517 (19.2)	2,401 (13.1)	7,280 (39.7)



applicants and this trend has increased over time (Table 4).

Over the 6 years examined, 18,348 black bear licences were sold, 3,324 (18.1%) to individuals who did not apply for moose or caribou licences. This percentage varied substantially from 37.9% in 1990 to 6.6% in 1993 (Table 3). Although some of these individuals may have misused their bear licences to hunt moose, their numbers were quite small compared with both the total number of moose hunters (223,687) and the estimated legal harvest of moose (115,721) during this period.

Comparison of black bear hunters with individuals under sentence for big game violations indicated that 25 of 482 (5.2%) purchased a bear licence during their conviction period.

#### Evidence of Abuse

Between 1972 and 1974, annual black bear licence sales increased from 365 to 4065, coinciding with the introduction of a quota system for moose and a major reduction in the number of moose licences from 22,863 in 1972 to 11,390 in 1973 (Fig. 3). Despite this massive increase in licences the numbers of

black bears killed did not increase (Fig. 2). While the evidence was admittedly circumstantial, this suggested to many that unsuccessful moose licence applicants were using the more easily obtained bear licence to gain access to favourite hunting areas to poach moose (Hancock and Pike 1980). This supposition was sufficiently respected to result in a closure of black bear hunting for the entire island from 1976 to 1978. After black bear hunting was reinstated in 1979 licence sales steadily increased once again until 1989 (Fig. 3) when a computerized application system was introduced eliminating the convenience of purchasing bear licences at local vendors. This resulted in a noticeable, but temporary drop in licence sales. Thereafter sales again increased and in 1994, 3605 bear licences were purchased. This pattern of increasing licence sales has led once more to allegations of widespread moose hunting infractions.

The only directed efforts to quantify such activity were made in 1986 and 1988. For MU 2 (1986) and MU's 5 and 6 (1988), investigation of several moose poaching incidents revealed that the accused possessed a black bear licence for the MU where the

Table 4. Sales of resident black bear licences expressed as a proportion of unsuccessful moose licence applicants in Newfoundland, 1989-1994.

Year	Number of hunters unsuccessful in obtaining a moose licence	Number (%) of these hunters with a black bear licence	Chi-square goodness-of-fit test for the interaction between success in moose application and purchasing a bear licence
1989	21,531	714 (3.3)	3.50 n.s.
1990	16,409	439 (2.7)	10.89 *
1991	20,350	713 (3.5)	33.35 *
1992	23,969	1,654 (6.9)	62.54 *
1993	27,938	1,765 (6.3)	108.56 *
1994	31,737	1,995 (6.3)	122.82 *
Total	141,934	7,280 (5.1)	

\*  $p < 0.001$

infraction occurred, and a moose licence for an adjacent but usually more inaccessible MU. Furthermore, examination of black bear licence sales for these 3 MU's indicated dramatic increases in the years previous with

little or no change in black bear harvests, further implying bear permits were being used to illegally harvest moose. In response, the fall bear hunting seasons for these MU's were changed, eliminating overlap with the

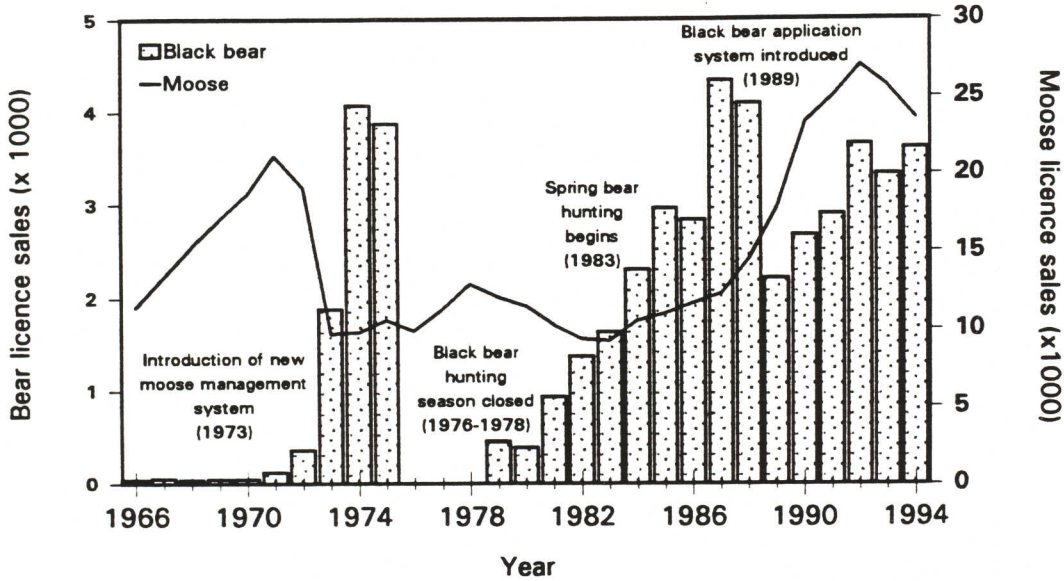


Fig. 3. Resident black bear and moose licence sales for Insular Newfoundland, fall hunt 1966-1994.

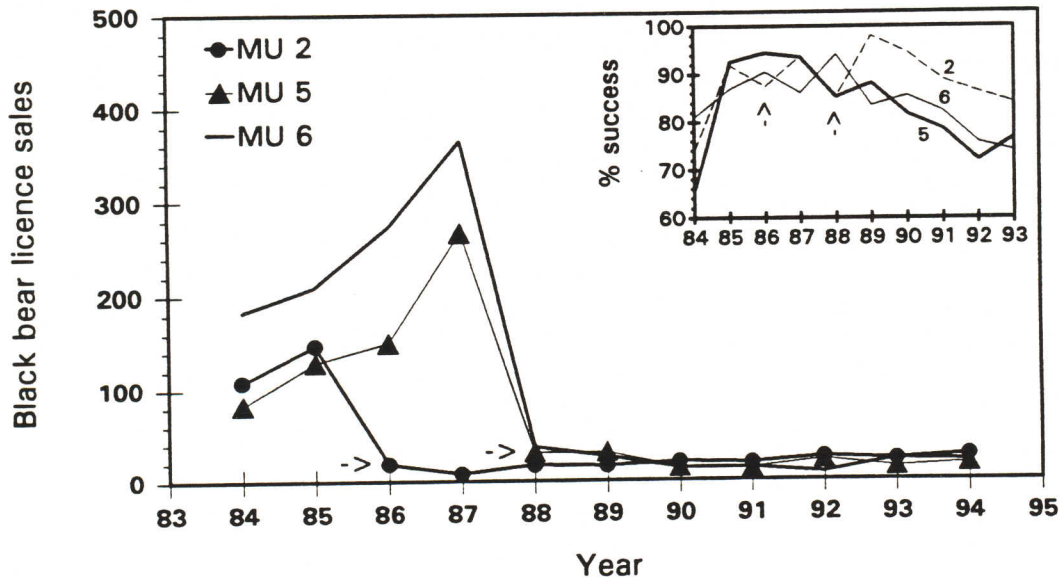


Fig. 4. Fall black bear licence sales for MU's 2, 5, and 6, 1984 to 1994. Non-overlapping moose and bear hunting seasons were introduced (->) in 1986 for MU 2, and 1988 for MU's 5 and 6. (Insert: Percent success rate of moose hunters for MU 2, 5, and 6, 1984-1993).

moose hunting seasons and thereby severely restricting any benefit of the bear licence as a ruse to hunt moose in the wrong area. This resulted in dramatic reductions in bear licence sales which have remained consistently low since that time (Figure 4). Significantly also, reported moose hunter success coincidentally decreased implying a possible connection between bear licence sales and moose hunter efficacy in these areas. Overall however there was no relationship between moose hunter success and black bear license sales on an island wide basis between 1989 and 1994 ( $p = 0.117$ ).

Examination of 1989-1994 licence sales revealed several patterns in the selection of black bear MU's by combination hunters. First, some MU's were more likely than others to have combination hunters. For example, hunters with a moose licence for less accessible and/or less preferred MU's were far more likely to buy a bear licence (MU 11, 9.4%; MU 18, 9.3%; and MU 20, 10.4%) than those with a moose licence in more accessible and/or preferred areas (MU 29, 1.4%; MU 30, 1.9%; and MU 40, 1.4%). Second, a large proportion of moose hunters in any given MU selected one or two particular MU's out of a possible 33 for their bear licences. Thus of all combination hunters, 40.6% bought moose and bear licences for the same MU, 35.5% for MU's that shared boundaries, and 23.9% for MU's distant from each other. In MU 18 for example 44% purchased bear licences for MU 17, a more accessible and an adjacent area. Similarly, MU 4 was selected for a bear licence by hunters with moose licences in MU's 3, 5, and 7, all of which share boundaries with MU 4. Finally, most combination hunters with bear and moose licences in different MU's either purchased bear licences for the MU where they lived (46.3%), or for the one adjacent to it (29.5%). Black bear hunters that were unsuccessful in obtaining a moose licence seemed to employ similar strategies

when selecting the MU's for their bear licence; 41.6% chose the MU in which they resided and 21.7% selected an adjacent one.

Some inaccessible areas were exceptions to this rule and generally moose hunters in these areas bought bear licences for a greater variety of MU's. In MU 37, for example, a very inaccessible area on the province's south coast, 25 of 33 possible bear hunting MU's were selected by combination hunters: 11.8% selected the same MU, 11.4% adjacent MU's, and 76.7% chose distant MU's.

## DISCUSSION

### The Problem

The dramatic increase in bear licence sales following the introduction of a quota system for moose in Newfoundland in 1973 (Hancock and Pike 1980), as well as the sharp decrease in bear licence sales following the introduction of non-overlapping hunting seasons for moose and bear in MU's 2, 5, and 6, strongly suggested a cause and effect relationship between these factors. Furthermore, the increased bear licences sales of 1972-1974 did not result in any comparable increase in the number of black bears harvested, further suggesting that these licences were being used for purposes other than hunting bear. In contrast, the harvest of black bears has increased substantially since about 1982, coincident this time with increasing bear licence sales. This may suggest a shift in hunter attitudes towards a genuine interest in bear hunting, perhaps in response to the NLWD efforts in this regard, especially considering that moose licence sales during this period also increased significantly.

The small proportions of successful (2.6%) and unsuccessful (5.1%) moose licence applicants who purchased black bear licences during the 1989-1994 period do not suggest widespread hunting abuse involving bear licences amongst these groups. Furthermore, only 1.6% of all moose hunters purchased bear licences for MU's different from

their moose MU and these were the category of hunters of greatest concern to the NLWD; all others either did not purchase bear licences or held both licences for the same MU, in which case no illegal use of the bear licence was intended.

While these figures suggest that misuse of black bear licences may not be presently widespread, 72% of all black bear licences purchased between 1989 and 1994 were sold to successful (32.3%) or unsuccessful (39.7%) moose licence applicants. Amongst hunters holding both licences 40.6% held them for the same MU, indicating a strong constituency for a double hunt opportunity; and this trend is increasing. Almost 60% of combination hunters held their bear and moose licences for different MU's however, most often selecting their bear licence for the MU in which they resided (46.3%) or a MU adjacent to where they lived (29.5%). Such patterns may suggest that these persons intended to hunt moose in the most convenient location, near home in this case, regardless of their moose MU. It could also simply suggest however that individuals prefer to hunt bear in accessible areas and/or areas near their residence, regardless of where they hold their moose licence. This may be especially true for those bear hunters who use baited stands. Nevertheless, the case for misuse is somewhat supported by the fact that moose hunters with licences for more inaccessible and/or less preferred areas were more likely to purchase bear licences than those licenced to hunt moose in preferred areas, even if these were distant from that residence.

Although only 5.1% of unsuccessful moose licence applicants purchased bear licences, these accounted for 39.7% of all bear licences sold between 1989-1994, and this percentage has been increasing recently. In addition 18.1% of all bear licences were acquired by individuals who did not apply for a moose licence at all. There are a variety of ways in which such hunters may have used

their bear licences, including legally to hunt bear or illegally to kill moose for themselves or to assist friends with moose licences in making their kill. Obviously moose taken by hunters with only a bear licence are not part of any quota and are never reported to game management authorities. Such misreporting impairs moose management by causing discrepancies in the hunter kill statistics which are used, along with census information, to assess moose population changes. In contrast, while it is presently illegal for bear hunters to assist individuals fill their moose licence, some conservation professionals in Newfoundland have suggested that this practice should be legitimized. They argue that all 'assistor' hunters would effect might be to increase moose hunter success rate, but that as long as kills were reported this could be accommodated through the normal quota review process. These relationships remain conjectural however because we cannot quantify how many bear hunters might engage in this activity and furthermore many factors impinge on the annual success rate of moose hunters in any MU. It would seem to us that a less complicated management policy might be to permit more than the 2 persons currently allowed on a moose party licence in Newfoundland, if it is desirable to increase the number of hunters in the field, rather than allow another kind of licence (ie. bear) to be used in this way.

The geographic pattern of bear MU's chosen by unsuccessful moose applicants relative to their place of residence, showed a strong similarity with that of combination hunters; 41.6% unsuccessful moose applicants purchased bear licences for the MU where they lived compared with 46.3% combination hunters; and 21.7% (vs 29.5%) chose MU's adjacent to where they lived. These patterns suggest that most bear hunters prefer the convenience of hunting near where they live and where they are familiar. As many hunters use bait to attract black bears the

ability to frequently and easily access an area is of real advantage. What is most relevant to the present discussion however is that most bear hunters, whether they are successful or unsuccessful in their application for a moose licence prefer to hunt where they live and thus neither group can be easily singled out on the basis of this statistic as more or less likely to illegally use their bear licence to harvest moose. Even those individuals who possess a moose licence for a distant MU and purchase their bear licence near home are not necessarily engaged in anything but completely legitimate hunting activity.

Although reportedly a common occurrence, only 25 (5.2%) individuals convicted of big game violations between 1989 and 1994 purchased a black bear licence during their 5-year sentence period. Obviously this is not a major wildlife management concern, even if all these individuals use their bear licences to illegally harvest moose or other wildlife. At any rate legislation changes now in progress will prohibit the sale of bear licences to individuals convicted of big game hunting violations closing this opportunity altogether.

### **Potential Management Solutions**

Wildlife management decisions ought to be based upon reasoned evaluation of the best information available and not upon personal opinion or even widespread rumour, otherwise policies are developed which may appease some groups in the short term, but jeopardize animal populations and negatively impact the hunting fraternity in the long term. Where such policies are viewed as vacillating and inconsistent with the general principals of sustained use they have the added potential to undermine public support for wildlife management decisions and regulations. This in turn may affect even unrelated policy issues and unnecessarily engage the sometimes undisciplined attention of politicians and their advisors, who become

progressively inclined to intervene on the basis of unsubstantiated constituent opinion. In the present situation, the evidence indicates that abuse of the black bear licence to illegally harvest moose probably occurred in the past and continues at present. However, the scale and significance of this activity appears far less than manifest perceptions by the public and some NLWD members would suggest. It therefore calls into question the appropriateness of the NLWD's decision to close the black bear hunt altogether in 1976-1978. Given this conclusion, what are the appropriate management responses?

### Close the Fall Black Bear Hunt

Not offering a fall black bear hunt would eliminate any potential for abuse of the bear licence to hunt moose. However resident hunters in Newfoundland are beginning to appreciate the black bear as a game species and their participation in the large fall hunt is obviously important in encouraging this change in attitude. Furthermore to deny legitimate hunting opportunities on the basis of some undefined level of illegal activity is counterproductive as this would not eliminate such practices but would alienate bona fide hunters. As well, non-residents have hunted bears in Newfoundland since 1962 and Newfoundland outfitters can attract non-resident clients by offering combination hunts for moose (or caribou) and black bear or bear-only hunts, thereby generating considerable revenue for local economies. Considering the small percentage of moose hunters that were even in a position to abuse the black bear licence to hunt moose, and the negative impacts on the outfitting industry specifically, on Newfoundland hunters generally, and on black bear hunters especially, we suggest that complete closure of the fall black bear hunting season is not warranted.

### Restricting black bear licence sales

Reducing the number of black bear li-

Table 5. Potential solutions, complications, and recommendations to reduce inappropriate use of black bear licences in Newfoundland.

Potential solutions	Complications	Recommendations
Close the fall black bear hunt thus eliminating the opportunity for abuse of the black bear licence to harvest moose.	This would prohibit legitimate combination hunts of black bear and moose by resident and non-resident hunters, and eliminate the revenue generated from bear hunting.	No.
Restrict black bear licence sales, thereby limiting the number of individuals that could potentially abuse them.	This would limit opportunities for legitimate resident and non-resident hunters to participate in a double hunt of black bear and moose.	No.
Introduce non-overlapping seasons for moose and bear to eliminate the opportunity to hunt on the black bear licence.	This would prohibit legitimate combination hunts of bear and moose, and may negatively impact on the outfitting industry and resident hunters.	No.
Introduce non-overlapping seasons but extend the bear harvest into the moose hunting season, with both species hunted in the same MU.	This would prohibit legitimate combination hunts of bear and moose in different MU's.	Yes, but only for MU's where a significant problem with bear licence misuse has been documented.
Increase enforcement in potential problem MU's to increase the likelihood of apprehending poachers.	This would result in increased cost in supplying additional resources and hiring extra staff to police MU's more frequently.	Yes.

cences might eliminate some abuse, but it would also reduce the number of legitimate hunters. In addition, the annual harvest of black bears is considered well below sustainable limits and quota restrictions are not, on this premise, warranted. Thus a restriction on fall bear hunting licences would not necessarily assist in the conservation of moose and is unnecessary for the conservation of black bear. Therefore we do not recommend restricting the sale of fall black bear licences at this time.

#### Separate moose and black bear hunting seasons

Non-overlapping hunting seasons for black bear and moose would help reduce misuse of black bear licences to hunt moose. Such seasons were implemented in MU 2 (1986) and MU's 5 and 6 (1988) when levels

of abuse were considered high and this resulted in a rapid, substantial and maintained reduction in black bear licence sales. It may also have contributed to a reduction in moose hunter success. However, outfitters did not operate in MU's 2 and 5, while in MU 6 only 1 outfitter operated with a small number of moose licences; thus there was little impact on the outfitting industry. Generally speaking non-overlapping seasons would have detrimental effects on outfitters by prohibiting combination hunts for black bear and moose or caribou. It would also unnecessarily prohibit bear hunters from accompanying companions who possess moose licences or at least from doing so while actually hunting for black bear and it would eliminate the possibility of a legitimate, resident 'double' hunt for bear and moose. Furthermore, this action would not absolutely prevent those

individuals who hold only a bear licence, or who hold moose and bear licences for different MU's, from hunting moose in their bear management area anyway. The only way to fully prevent this would be to eliminate the bear hunt altogether. Therefore unless evidence indicates a serious problem for a particular MU, the implementation of non-overlapping seasons is not recommended.

One way to alleviate some of the problems associated with non-overlapping seasons would be to allow only combination hunters to hunt black bear during the moose season and only in the MU for which they held their moose licence; all other bear licence holders would be forced to hunt in a separate season. While helping reduce any possible licence abuse by bear hunters without a moose licence, or with a moose licence for a different MU than their black bear licence, this would still allow some hunters a double hunt of moose and bear. It would, however, prohibit the hunter who wished to legitimately hunt bear and moose in different MU's from doing so during the same season and/or hunting trip. In addition, bear-only hunters would have a much shorter bear hunting season than combination hunters.

#### Increase wildlife enforcement and hunter education programs

Penalties for illegally hunting big game in Newfoundland and Labrador are considerable. For a first offence, the maximum charge is \$5,000 and/or imprisonment up to 6 months, and for a second offence within a five year period \$10,000.00 and imprisonment up to 6 months. In addition, all equipment, including rifles and vehicles, are confiscated. Unfortunately, because field officers are responsible for large areas and resources are limited, many people continue to illegally harvest moose. However establishing policies which restrict legitimate hunters due to a shortage of enforcement capability is not an appropriate, although it is an often opted for,

solution to licence abuse problems. Such policies only serve to alienate the hunting public and undermine their support for management initiatives. This support is crucial to the conservation of wildlife (Mahoney 1995) and to the resistance sound wildlife management can display in the face of politically motivated programs, interventions and manipulations. It is furthermore critical to the development and maintenance of true hunting ethics. Hunters must view wildlife agencies and the professionals they employ as agents for the conservation of both wildlife and hunting in order to forego exploitive opportunities.

Further, although overall the problem of black bear licence abuse was far less than perceived, it does occur. Patterns in the selection of MU's for bear and moose hunting that emerged from our analysis make it possible to focus enforcement activities toward particular areas. For example, many combination hunters selected bear licences for MU's adjacent to that of their moose licence, possibly to extend hunting opportunities into a larger, or a more preferred, MU. Evaluation of MU's pairs for which combination hunters held their moose and bear licences have identified such areas and enforcement officers could use this information to more effectively distribute their patrol capabilities. In other MU's these patterns were not obvious and such areas may not warrant special attention.

Throughout the course of this debate, and even during periods when significant policy shifts such as season closures were being implemented, no attempts were made to explain to hunters the problem of black bear licence abuse and its implications for the conservation and management of moose and blackbears in Newfoundland. In hindsight this seems remarkable, given the common perception that such abuse was widespread. However, the tendency for wildlife management agencies to overlook the potential value

of such dialogue with the hunting public may not be unusual and may sometimes signify a belief that hunters themselves being part of the problem, may not, simultaneously, be part of the solution. However hunter education must be an ongoing process and while never completely effective in changing attitudes or instilling values, it is an important component of wildlife management (Mahoney 1995). Clearly in the present instance a detailed exposition of the real and serious implications of licence abuse ought to be developed and disseminated to hunters. This, along with prudent policy initiatives, will demonstrate to legitimate hunters that every attempt is being made to avoid compromising their privileges, while at the same time safeguarding the principals of effective wildlife management, including that of open and respectful dialogue between wildlife professionals and hunters themselves.

Cliffs, NJ, 718pp.

#### **ACKNOWLEDGEMENTS**

We thank Jim Schaefer, Gene Mercer, Jan Adamczewski, and the unknown reviewers for their comments. We also acknowledge Charlie Butler and Sharon Tiller for their previous assessments of this problem.

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#### ACKNOWLEDGEMENTS

Linda Siczkar worked long hours formatting and typesetting manuscripts.